I CLAIM:

1. A teleoperator system for manipulating objects located in a workspace at a worksite by an operator from a remote control operator's station comprising,

manipulator means at the work site including end effector means for manipulation of an object at the workspace,

controller means including hand-operated means at the control station connected to said manipulator means for remote control of the manipulator means by control of the hand-operated means by the operator,

video camera means for viewing the workspace, and

means responsive to the video camera means for producing an image of the workspace which image is located adjacent the hand-operated means for viewing by the operator in the direction of said hand-operated means during operation of the hand-operated means and providing the operator with a sense that the end effector means and hand-operated means are substantially integral.

2. A teleoperator system as defined in Claim 1 wherein said video camera means comprises means for viewing the workspace from different angles for production of stereoscopic signal outputs,

said means for producing an image comprising means for producing a 3-dimensional image of the workspace in response to said stereoscopic signal outputs.

3. A teleoperator system as defined in Claim 2 wherein the angle between the optical axes of said means for viewing the workspace is substantially equal to the operator's interocular viewing angle of the image.

4. A teleoperator system as defined in Claim 2 wherein said hand-operated means comprises a control arm mounted

for movement in any pivotal direction, the image of the end effector means and position of the movable control arm as sensed by the operator providing the operator with a sense that the end effective means comprises an extension of the control arm.

5. A teleoperator system as defined in Claim 4 wherein said manipulator includes an arm mounted for movement in any pivotal direction, angular movement of the control arm by the operator producing substantially the same angular movement of the manipulator arm.

6. A teleoperator system as defined in Claim 5 wherein the length of path from the eyes of the operator to the image of the workspace and length of control arm are related by a factor k to the optical path length from the video camera means to the workspace and length of manipulator arm, respectively, where k is a constant.

7. A teleoperator system as defined in Claim 2 wherein said image viewable by the operator comprises a virtual image.

8. A teleoperator system as defined in Claim 7 wherein said means for producing an image includes display means for producing a top-to-bottom reversed 3-dimensional, real image of the workspace,

a mirror positioned in front of the operator so as to receive the reversed real image from the display means and to reflect the same toward the operator's eyes for viewing of said virtual image in the mirror.

9. A teleoperator system as defined in Claim 8 wherein the display means is located above the mirror and faces toward the mirror.

10. A teleoperator system as defined in Claim 7 wherein the display means faces downwardly at an angle from vertical.

11. A teleoperator system as defined in Claim 1 wherein said manipulator means comprises first and second manipulators and said controller means comprises first and second hand-operated means for remote control of said first and second manipulators, respectively.

12. A teleoperator system as defined in Claim 1 including an endoscope comprising an operating section and an insertion section insertable in a cavity in which the workspace is located and having observing window means through which the workspace is viewed by the video camera means.

13. A teleoperator system as defined in Claim 12 wherein said manipulator means includes an operating section and insertion section insertable in said cavity for manipulation of an object in the cavity.

14. A teleoperator system as defined in Claim 13 wherein said manipulator means comprise first and second manipulators and said controller means comprise first and second hand-operated means for remote control of said first and second manipulators, respectively.

15. A teleoperator system as defined in Claim 14 including means for attaching the operating sections of the manipulators and endoscope to a support rail of a surgical table for support thereof during surgery.

16. A teleoperator system as defined in Claim 1 including force feedback from the manipulator means to

the hand-operated means which, together with said image of the workspace, provides for visual and force telepresence operation of the system.

17. A teleoperator system as defined in Claim 1 including first and second stereophonic microphones for picking up sounds from the workspace, and

first and second speakers at the remote control station responsive to outputs from said respective first and second microphones for producing a stereophonic sound output and providing the operator with an audio perspective present at the workspace.

18. A teleoperator system as defined in Claim 1 wherein said means for producing an image of the workspace includes display means for producing a real image of the workspace adjacent the hand operated means for direct viewing by the operator.

19. A teleoperator system as defined in Claim 1 including an endoscope having an accessory channel, and wherein

said manipulator means comprising a steerable catheter extending through the channel, said end effector means being carried by said steerable catheter, said workspace being viewed by said video camera means through said endoscope.

20. In a method of performing surgery by an operator at a remote location which includes,

inserting the insertion end of an endoscope and of first and second manipulators into a subject,

supporting the operating ends of the endoscope and first and second manipulators,

employing said endoscope for viewing an object

inside the subject by video camera means,

controlling said first and second manipulators by respective first and second hand-operated controllers remotely located from said manipulators, and

presenting an image of the object viewed by the video camera means at a location adjacent the first and second hand-operated controllers for viewing by the operator during operation of the first and second hand-operated controllers and providing the operator with a sense that the first and second manipulators, and respective first and second hand-operated controllers are substantially integral.

21. In a method as defined in Claim 20 wherein a stereoscopic video camera is employed for viewing the object by said endoscope, and

wherein the image presented is a 3-dimensional image.

22. In a method as defined in Claim 20 which includes presenting a magnified image of the object for viewing by the operator.

23. In a method as defined in Claim 20 wherein the image viewed by the operator comprises a virtual image.

24. In a method as defined in Claim 23 wherein the image viewed by the operator comprises a real image.

25. In a method as defined in Claim 20 wherein the endoscope and first and second manipulators are inserted into the subject's abdomen, said method including insufflating the abdomen.

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